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SURFACE MINING & RECLAMATION

GLOSSARY

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GLOSSARY OF SURFACE MINING - RECLAMATION TERMS

-A-

Abandoned: An operation where no mineral is being produced and where the operation will not continue or resume.

Abatement: (Mine Drainage usage) The reduction of the pollution effects of mine drainage.

Abutment: The point of contact between the ends of an embankment and the natural ground material.

Access Road: Any haul road or other road constructed, improved, maintained, or used by the operator which ends at the pit or bench, and is located within the area of land affected.

Acid and Toxic Producing Deposits: Natural as well as reworked earth materials having chemical and physical characteristics that, when exposed to mining or post mining conditions of drainage, exposed to air, or other processes, may produce acid conditions, high concentrations of bases or metallic compounds both aqueous solution and in the solid phase in sufficient concentration individually or combinations to adversely affect biological ecosystems.

Acid Mine Drainage: Any acid water draining or flowing on, or having drained or flowed off, any area of land affected by mining.

Acid Soil: Generally, a soil that is acid throughout most or all of the parts of it that plant roots occupy. Commonly applied to only the surface-plowed layer or to some other specific layer or horizon of a soil. Practically, this means a soil more acid than pH 6.6; precisely, a soil with a pH value less than 7.0. A soil having a preponderance of hydrogen over hydroxyl ions in the soil solution.

Acid Spoil: (See also Spoil and Toxic Spoil) Usually spoil material containing sufficient pyrite so that weathering produces acid water and the pH of the soil determined by standard methods of soil analysis is between 4.0 and 6.9.

Acre-Foot: A term used in measuring the volume of water, equal to the quantity required to cover 1 acre 1 ft. in depth, or 43,560 cu. ft.

Active Surface Mine Operation: A mining operation where land is being disturbed in preparation for and during the removal of a mineral.

Adverse Visual Impact: Any impact on the vegetation, landform, or any introduction of a structure which interrupts or adversely changes the visual character of the landscape and disrupts the harmony of the natural elements.

Aeration, soil: The process by which air in the soil is replenished by air from the atmosphere. In a well-aerated soil the air in the soil is similar in composition to the atmosphere above the soil. Poorly aerated soils usually contain a much higher percentage of carbon dioxide and a correspondingly lower percentage of oxygen. The rate of aeration depends largely on the volume and continuity of pores in the soil.

Afforestation: The artificial establishment of forest crops by planting or sowing on land that has not previously, or not recently, grown tree crops.

Agricultural Limestone: Contains sufficient calcium and magnesium carbonate to be equivalent to not less than 80 percent calcium carbonate and must be fine enough so that not less than 90 percent shall pass through a U.S. Standard No. 10 sieve and not less than 35 percent shall pass through a U.S. Standard No. 50 sieve.

Aggradation: The process by which the stream or reservoir bed is raised in elevation or built up by the deposition of material transported thereto by water or wind. It is the opposite of degradation.

Agronomist: A specialist in soil and crop sciences (as affecting the establishment and maintenance of grasses, erosion control, and soil management).

Air Porosity: The proportion of the bulk volume of soil that is filled with air at any given time or under a given condition, such as a specified moisture condition. Commonly considered to be the larger pores; that is, those filled with air when the soil is at field capacity. Sometimes called noncapillary pore space when determined as the bulk volume of pores that are unable to hold water when subjected to a tension of 60 cm (23.63 in.) of water.

Alkali Soil: (a) A soil with a high degree of alkalinity (pH 8.5 or higher) or with a high exchangeable sodium content (15% or more of the exchange capacity) or both. (b) A soil that contains sufficient alkali (sodium) to interfere with the growth of most crop plants (newer term is sodic soil).

Alluvial: Describes material such as earth, sand, gravel, or other rock or mineral materials transported by and laid down by flowing water.

Amendment, soil: An alteration of the properties of a soil, by the addition of substances such as fertilizers, lime, gypsum, or sawdust to the soil for the purpose of making it more suitable for the production of plants.

Amendment: Any material, such as lime, gypsum, sawdust, or synthetic conditioners, that is worked into the soil to make it more productive. Technically, a fertilizer is also an amendment but the term, "amendment" is used most commonly for added materials other than fertilizer.

Angle of Dip: The angle an inclined stratum makes with the horizontal.

Angle of Repose: The greatest angle to the horizontal that any loose or fragmented solid material will stand without sliding or come to rest when poured or dumped in a pile or on a slope.

Angle of Slide: The slope measured in degrees of deviation from the horizontal, on which loose or fragmented solid materials will start to slide. It is a slightly greater angle than the angle of repose.

Annual Plant:(annuals) A plant that completes its life cycle and dies in 1 year or less.

Anticline: A fold of rock beds that is convex upward.

Approximate Original Contour: That surface configuration achieved by backfilling and grading of the mined area so that it closely resembles the surface configuration of the land prior to mining and blends into and complements the drainage pattern of the surrounding terrain, with all high walls, spoil piles, and depressions eliminated except that water impoundments may be permitted where the regulatory authority determines that they are necessary or desirable for reclamation or public recreation purposes.

Apron: A floor or lining to protect a surface from erosion; for example, the pavement below chutes, spillways, culverts, or at the toes of dams.

Aquifer: A water bearing formation through which water moves more readily than in adjacent formations with lower permeability.

Aquitard: A rock unit with relatively low permeability that retards the flow of water.

Area of land Affected: The area of land from which overburden is to be or has been removed, and upon which the overburden is to be or has been deposited, and includes all lands affected by the construction of new railroad loops and roads, or the improvement or use of existing railroad loops and roads to gain access and to haul the mineral.

Area Mining: A method of surface mining in lands of relatively gentle slopes and flat-lying bedrocks or mineral deposits through the digging of a succession of contiguous parallel pits. In a given pit or cut, overburden removed is cast (placed) in the mined-out cut immediately adjacent.

Argillaceous: An adjective describing a rock unit having a high clay content.

Artesian: Ground water under sufficient pressure to cause the water level in a drilled hole to rise above the top of the rock unit.

Aspect: The direction toward which a slope faces. Exposure.

Attitude of Bedrock: A general term describing the relation of some directional features to a rock in a horizontal surface.

Auger Mining: The process of extracting coal at a cutface or highwall by drilling holes laterally into an exposed coalbed with a large-diameter auger type bit that delivers coal at the point of entry as the bit advances into the wall or face.

Available Nutrient: That portion of any element or compound in the soil that can be readily absorbed and assimilated by growing plants.

Available Water: The portion of water in a soil that can be readily absorbed by plant roots. Considered by most scientists to be that water held in the soil against a pressure of up to approximately 15 bars.

Available Water-holding Capacity (soils): The capacity to store water available for use by plants, usually expressed in linear depths of water per unit depth of soil. Commonly defined as the difference between the percentage of soil water at field capacity and the percentage at the wilting point. This difference in percent multiplied by the bulk density and divided by 100 gives a value in surface inches of water per inch depth of soil.

-B-

Back Blade: In regrading, to drag the blade of a bulldozer or grader as the machine moves backward, as opposed to pushing the blade forward.

Backfill and Grade: To place soil, overburden, or waste rock into a surface mine excavation and level or shape this fill material to a desired surface configuration.

Background level (water quality usage): The natural or normal concentration of a chemical or other constituents in water.

Band: Slate or rock interstratified with coal; also called "slate band" or "sulphur band".

Bank: A mound of mine refuse. Synonyms include tip, culm, gob, refuse pile, slate dump, stack, and heap.

Baseline Data: A known quantity used as a control from which an inference or an argument is based.

Base of Highwall: The point of intersection between the highwall and the plane formed at the base of the excavated material.

Basic Elements: The four major elements (form, line, color, and texture) which determine how the character of a landscape is perceived.

Basin: A natural depression of strata containing a coal bed or other stratified deposit.

Basin, Stilling: A structure or excavation which reduces velocity or turbulence of flowing or falling water.

Bed or Streambed: The bottom of a water course.

Bedload: The sediment that moves by sliding, rolling, or bounding on or very near the streambed; sediment moved mainly by gravitational forces, or both, but at velocities less than the surrounding flow.

Bedrock: Any solid rock underlying soil, sand, clay, silt, and any other earthy materials.

Bench: The surface of an excavated area at some point between the material being mined and the original surface of the ground on which equipment can set, move or operate. A working road or base below a highwall as in contour stripping for coal.

Bench Method, Extended: The use of a large capacity walking dragline in deep overburden operating from a machine-supporting bench formed by filling the V between the bank and the spoil. This V-section is formed from material that falls from the bank or is placed by the dragline and it must be rehandled. Rehandling averages approximately 10 to 25 percent of the solid bank, depending on the height of the bench.

Benefication: Treatment of a raw mineral to improve its properties.

Berm: A raised and elongated area of earth for erosion control intended to direct the flow of water.

Berm Interval: Vertical distance from crest of berm to its underlying toe as in a bank or bench.

Binder: A streak of impurity in a coal seam.

Bituminous Coal: A coal which is high in carbonaceous matter, having between 15 and 50 percent volatile matter.

Blind Drain: A trench filled with stones selected so as to fill a trench, yet to allow the flow of water through it.

Block Coal: A bituminous coal which breaks into large cubical blocks.

Block cut Method: This method of surface mining removes overburden and places it around the periphery of a box-shaped cut. After coal is removed the spoil is pushed back into the cut and the surface is blended into the topography.

Blossom: The decomposed outcrop of a coal bed.

Bone: Slaty coal or carbonaceous shale found in the coal seam. Also called "bone coal" or "bony coal".

Borrow Pit: The excavation resulting from the extraction of borrow soil materials.

Box Cut: A rectangular excavation made at the initiation of a surface mine by removing the overburden from bedrock so that essentially vertical walls result.

Breaker Refuse: Slate, bone, or rock as removed by hand or mechanical cleaners in all classes of breakers.

Breakthrough: Interception of an underground mine by surface or auger mining.

Broadcast Seeding: Scattering seed on the surface of the soil. Contrast with drill seeding, which places the seed in rows in the soil.

Brush Matting: (a) A matting of branches placed on badly eroded land to conserve moisture and reduce erosion while trees or other vegetative cover are being established. (b) A matting of mesh wire and brush used to retard streambank erosion.

Buffer: Substances in soil or water that act chemically to resist changes in reaction or pH.

Buffer Strips:

(1) Unaffected areas between the mining operation and areas designated for other public and private use.

(2) Strips of grass or other erosion-resisting vegetation between or below surface or auger mining disturbances.

Bulk Density, Soil: The mass of dry soil per unit bulk volume. The bulk volume is determined before drying to constant weight at 105 degrees C.

Bunchgrass: A grass that does not have rhizomes or stolons and forms a bunch or tuft.

-C-

Calcareous Soil: Soil containing sufficient free calcium carbonate or calcium-magnesium carbonate to effervesce visibly when treated with cold 0.1 N hydrochloric acid.

Capillary Water: The water held in the "capillary" or small pores of a soil, usually with tension greater than 60 cm (23.63 in.) of water. Much of this water is considered to be readily available to plants.

Channel Stabilization: Erosion prevention and stabilization of velocity distribution in a channel, using jetties, drops, revetments, vegetation, and other measures.

Characteristic Landscape: The established landscape within an area being viewed. This does not necessarily mean a naturalistic character. It could refer to a farming community, an urban landscape, or a primarily natural environment.

Check Dam: Small dam constructed in a gully or other small watercourse to decrease the streamflow velocity, minimize channel scour, and promote deposition of sediment.

Chiseling: Breaking or loosening the soil, without inversion, with a chisel cultivator or chisel plow.

Clay (soils): (a) A mineral soil separate consisting of particles less than 0.001 mm in equivalent diameter. (b) A soil textural class. (c) (engineering) A fine-grained soil that has a high plasticity index in relation to the liquid limits.

Claypan: A dense, compact layer in the subsoil having a much higher clay content then the overlying material, from which it is separated by a sharply defined boundary; formed by downward movement of clay or by synthesis of clay in place during soil formation. Claypans are usually hard when dry, and plastic and sticky when wet. Also, they usually impede the movement of water and air, and the growth of plant roots.

Clearing: The removal of vegetation, structures, or other objects as an item of construction or mining.

Climate: The sum total of all atmospheric or meteorological influences, principally temperature, moisture, wind, pressure, and evaporation, which combine to characterize a region and give it individuality by influencing the nature of its land forms, soils, vegetation, and land use.

Climax Community: A stable, self perpetuating community that represents the final stage of ecological succession for a given area.

Clod: A compact, coherent mass of soil ranging in size from 5 to 10 mm (0.2 to 0.4 in.) to as much as 200 to 250 mm (8 to 10 in.); produced artifically, usually by the activity of man by plowing or digging, especially when these operations are performed on clay soils that are either too wet or too dry for normal tillage operations.

Clone: A group of plants derived by asexual reproduction from a single parent plant. Such plants are, therefore, of the same genetic constitution.

Coal: A combustible rock containing more than 50 percent by weight and more than 70 percent by volume of carbonaceous materials (as distinguishable from black shale).

Coal Horizon: The stratigraphic position where a coal should occur - generally used to signify the position that a coal should occupy but is absent.

Coal Seam: A layer, vein, or deposit of coal. A stratigraphic part of the earth's surface containing coal.

Community: An assemblage of biotic components that occupy a particular habitat or ecosystem.

Compaction: The closing of the pore spaces amoung the particles of soil and rock, generally caused by running heavy equipment over the areas, as in the process of leveling the overburden material of strip mine banks.

Companion Crop: Seeding of a short-life crop with the permanent species to aid in erosion control until the permanent species are established.

Composite Sample: A single sample formed by combining all the individual samples that pertain to a single sampling unit.

Concentration (water quality usage): The amount of a substance occurring in a given amount of water - common unit is parts per million (ppm) or milligrams per liter (mg/l)

Condensation Trap: A condensation trap is a deep planting basin containing a stock seedling. The basin is covered with a plastic sheet secured around the edge to hold a large amount of air. A center hole allows the plant to grow and the sheeting collects moisture which trickles down, irrigating the plant.

Conditions: The general requirements and special stipulations formulated and made a part of the contract to protect the resources and the environment (land, air, and water) and provide for the reclamation of any damage caused by exploration, development, or extraction operations or any activities related thereto.

Conductivity: A measure of the ability of water to conduct an electric current, which may be used for approximating the salinity in water.

Conifer: A tree belonging to the order Coniferae, usually evergreen with cones and needle-shaped or scale-like leaves and producing wood known commercially as "softwood".

Conservation: The protection, improvement, and wise use of natural resources according to principles that will assure their highest economic or social benefits.

Contour: The shape of a land surface as expressed by contour lines.

Contour Grading Plan: A drawing showing an arrangement of contours intended to integrate construction and topography, improve appearance, retard erosion, and improve drainage.

Contour Line: (a) An imaginary line on the surface of the earth connecting points of the same elevation. (b) A line drawn on a map connecting points of the same elevation.

Contour Mining: The general term for surface mining in steep terrain, in which overburden is removed and the mineral or rock is mined by cutting into a sloping land surface and then "following" the mineral or bedrock along a hillside with continuous excavations being made at approximately the same elevation.

Contour Strip Mining: That strip mining method commonly carried out in areas of rough and hilly topography in which the coal or mineral seam outcrops along the side of the slope and entrance is made to the seam by excavating a bench or table cut at and along the site of the seam outcropping with the excavated overburden commonly being cast down the slope below the mineral seam and the operating bench.

Contrast: The effect of a striking difference in the form, line, color, or texture of an area being viewed.

Contrast Rating: A method of determing the extent of visual impact for an existing or proposed activity that will modify any landscape feature.

Cool-season Plant: A plant that makes its major growth during the cool portion of the year, primarily in the spring and fall, but in some localities in the winter.

Core Drilling: TThe process by which a cylindrical sample of rock and other strata is obtained through the use of a hollow drilling bit which cuts and retains a section of the rock or other strata penetrated.

Core, Impervious: The interior portion of an embankment so designed and constructed as to prevent the passage of water.

Corridor: A strip or band of land forming a passageway between two or more points. The width of a corridor may vary from several miles in rural areas to a lesser width in urban areas.

Creep: Slow mass movement of soil and soil material down relatively steep slopes primarily under the influence of gravity, but facilitated by saturation with water, strong winds, and by alternate freezing and thawing.

Crest: The top of a dam or spillway to which water must rise before passing over the structure. It is frequently restricted to the overflow portion.

Crop Coal: Coal at the outcrop of the seam. It is usually considered of inferior quality due to partial oxidation, although this is not always true.

Crust: A thin layer of hard soil that forms on the surface of many soils when they are dry.

Culm: The waste or slack of the Pennsylvania anthracite mines.

Culvert: A closed conduit for the free passage of surface drainage water under a roadway or other embankment.

Cut: Longitudinal excavation made by a strip-mining machine to remove overburden in a single progressive line from one side or end of the property.

Cut and Fill: A process of earth moving by excavating part of an area and using the excavated material for adjacent embankments or fill areas.

Cutface: An unmined steep side of a pit, mine cut, or quarry.

-D-

Deciduous: Refers to a tree that sheds all its leaves every year at a certain season.

Deep Chiseling: Deep chiseling is a surface treatment that loosens compacted spoils. The process creates a series of parallel slots on the contour in the spoils surface which impedes water flows and markedly increases infiltration.

Deflation: Land deterioration or soil erosion, caused or produced by wind.

Degradation: The process by which the streambed is lowered in elevation by the carrying away of material due to water or wind action. It is the opposite of aggradation.

Density, Forage: The percent of ground surface which appears to be completely covered by vegetation when viewed directly from above.

Density of Water-sediment Mixture: The bulk density which is the mass per unit volume including both water and sediment.'

Depth Integration: A method of sampling to obtain a representative sample of the water-sediment discharge from every part of a stream vertical, except in a small unsampled zone near the streambed.

Depth-integrated Sample: A water-sediment mixture that is accumulated continuously in a sampler that moves vertically at an approximately constant transit rate between the surface and a point a few inches above the bed of a stream, and that admits the mixture at a velocity about equal to the instantaneous stream velocity at each point in the vertical. Because the sampler intake is a few inches above the sampler bottom, there is an unsampled zone a few inches deep just above the bed of the stream.

Desilting Area: An area of grass, shrubs, or other vegetation used for inducing deposition of silt and other debris from flowing water.

Dip of Coalbed: The angle at which the bed or stratum is inclined from the horizontal.

Direct Seeding: A method of establishing a stand of vegetation by sowing seed on the ground surface.

Discharge-weighted Concentration: The dry weight of sediment in a unit volume of stream discharge, or the ration of the discharge of dry weight of sediment to the discharge by weight of water-sediment mixture. Usually expressed in milligrams per liter (mg/l).

Dissolved Oxygen: A measure of the amount of free oxygen (oxygen which is not chemically combined with other substances) available in water to oxidize oxygen demanding materials.

Dissolved Solids: The difference between the total and suspended solids in water.

Disturbed Land: Land on which excavation has occurred or upon which overburden has been deposited, or both.

Diversion: Channel constructed across a slope to intercept surface runoff; changing the course of all or part of a stream.

Diversion Ditch: A man-made waterway used for collection surface runoff on the uphill side of a mine in order to keep it out of the workings; a ditch designed to change the normal or actual course of water.

Dominant Elements: The basic elements in a particular landscape which exert the greatest influence on the visual character of the landscape.

Dominant Species: The conspicuous species of a particular community. Generally, those which are highly successful ecologically and which determine to a considerable extent the conditions under which the associated species must grow.

Double (supplemental) Root Transplant: A method of clipping above the crown of one of two plants interconnected with a horizontal rhizome. The remaining plant is then replanted with the two intact connected root systems placed vertically in the soil.

Dozer or Bulldozer: Tractor with a steel plate or blade mounted on the front end in such a manner that it can be used to cut into earth or other material and move said material primarily forward by pushing.

Dozer Basins: Intervals of dozer bladed basins in soil to help trap moisture in puddles which in turn enhances seedling establishment in the bottom of these basins.

Dragline: Type of excavating equipment which utilizes a cable-hung bucket and digs by pulling the bucket toward itself.

Drainage Plan: The proposed methods of collection, treatment and discharge of all waters within the affected drainage area as defined in the premining plan.

Draw Slate: A soft slate of shale immediately above certain coal seams which falls quite easily when coal support is withdrawn.

Drift: A deep mine entry driven directly into a horizontal or near horizontal mineral seam or vein when it outcrops or is exposed at the ground surface.

Drill Seeding: Planting seed with an implement utilizing multiple disc plates or hoes to open parallel furrows for receiving the see.

Dump: Place where material is deposited for storage, eg., topsoil dump, overburden dump.

-E-

Ecology: The science that deals with the mutual relation of plants and animals to one another and to their environment.

Ecological Association: Climax plant communities in which the dominant species are essentially the same to the extent that any differences in composition are due to chance dissemination or to a transitory historic factor rather than to a fundamental dissimilarity in habitat potentialities.

Ecological Diversity: A measurement of the number of species present in a given community; the greater the number of species the higher the diversity.

Ecoregion: A geographical area over which the environmental complex, produced by the climate, topography, and soil, is sufficiently uniform to permit development of characteristic types of ecological associations.

Ecosystem: A community, including all the component opinions, together with the environment, forming an interacting system.

Effective Depth of Soil: Depth of soil to an inhibiting layer, i.e., bedrock, caleche, watertable, distinctive contrasting layer, depth of moisture penetration; a chemical or physical barrier.

Effective Precipitation: That portion of total prescipitation that becomes available for plant growth. It does not include precipitation lost to deep percolation below the root zone or to surface runoff.

Effluent: Any water flowing out of the ground or from an enclosure to the surface flow network.

Enhancement: A short-term management alternative which is accomplished to increase the visual variety where little or no variety exists at present.

Environment: All external conditions that may act upon an organism or soil to influence its development, including sunlight, temperature, moisture and other organisms.

Environmental Monitoring: To keep track of or measure various environmental parameters before, during, or after mining activity.

Environmental Protection: A program specifically designed to minimize adverse environmental impacts resulting from land disturbances by pre-planned reclamation or rehabilitation actions. It also includes the monitoring of surface uses and the provision of technical services and evaluations.

Erodible: Susceptible to erosion.

Erodibility: The relative ease with which one soil erodes under specified conditions of slope as compared with other soils under the same conditions; this applies to both sheet and gully erosion.

Erosion: The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep. Detachment and movement of soil or rock fragments by water, wind or ice, or gravity.

Erosive: Refers to wind or water having sufficient velocity to cause erosion. Not to be confused with erodible as a quality of soil.

Essential Element (plant nutrition): A chemical element required for the normal growth of plants.

Eutrophication: The process of a lake becoming rich in dissolved nutrients thereby enhancing the growth of aquatic plants leading to possible seasonal oxygen deficiencies and accelerating the rate of lake aging.

Evapotranspiration: A collective term meaning the loss of water to the atmosphere from both evaporation and transpiration by vegetation.

Excavation: The act of removing overburden material.

Exotic: An organism that has been introduced from another continent.

Exploration: The search for mineral deposits by drill-holes, pits, trenches and the new excavations of underground workings. Exploration aims at locating the presence of economic deposits and establishing their nature, shape and quality.

-F-

Family, Soil: In soil classification one of the categories intermediate between the great soil group and the soil series.

Ferric Iron: An oxidized or high-valence form of iron (Fe^{+3}) responsible for red, yellow, and brown colors in soils and water.

Ferrous Iron: A reduced or low-valence form of iron (Fe^{+2}), imparting a blue-gray appearance to water and some wet subsoils on long standing.

Fertility, Soil: The quality of a soil that enables it to provide nutrients in adequate amounts and in proper balance for the growth of specified plants when other growth factors (such as light, moisture, temperature, and the physical condition of the soil) are favorable.

Fertilizer: Any organic or inorganic material of natural or synthetic origin which is added to a soil to supply certain elements essential to the growth of plants.

Fertilizer Grade: The guaranteed minimum analysis in whole numbers, in percent, of the major plant nutrient elements contained in a fertilizer material or in a mixed fertilizer. For example, a fertilizer with a grade of 20-10-5 contains 20 percent nitrogen (N), 10 percent available phosphoric acid (P_2O_5), and 5 percent potassium oxide (K_2O).

Fertilizer Requirement: The quantity of certain plant nutrient elements needed, in addition to the amount supplied by the soil, to increase plant growth to a designated optimum.

Fill: Depth to which material is to be placed (filled) to bring the surface to a predetermined grade. Also, the material itself.

Fill Bench: That portion of a bench or table which is formed by depositing overburden beyond or down slope from the cut section as formed in the contour method of strip mining.

Filter: A device or structure for removing solid or colloidal material, usually of a type that cannot be removed by sedimentation, from water, sewage, or other liquid.

Final Contour: The contour existing in a surface mined area after overburden is replaced and graded.

Final Cut: In area mining, the last linear excavation; if left unfilled a highwall remains.

Fine-material Load or Wash Load: That part of the total sediment load that is composed of particle sizes not present in appreciable quantities in the bed sediment. (Normally the fine-material load is finer than 0.062 mm).

Fire Clay: Soft, unbedded, gray or white clay, high in silica and hydrated aluminum silicates, and low in iron and alkalies. Fire clay forms the seat earth of many coalbeds and may have value of refractory clay.

Flora: The sum total of the kinds of plants in an area at one time.

Flume: An open channel on a prepared grade.

Flushout: An accumulation of water that is removed suddenly from surface-mined lands by heavy precipitation. Such water may contain contaminants in sufficient concentration to result in pollution of the receiving stream.

Fold Axis: A line drawn on a rock stratum at the point of intersection of the axial plane (which is a plane passing through the trough of a syncline or the peak of an anticline.)

Forage: Unharvested plant material which can be used as feed by domestic animals. Forage may be grazed or cut for hay.

Forb; An herbaceous plant that is not a grass, sedge, or rush.

Foreground-middleground: The area visible from a travel route or use area to a distance of 3 to 5 miles. The outer boundary of this zone is defined as the point where the texture and form of individual plants is no longer apparent in the landscape. Vegetation is apparent only in patterns or outline.

Forest Land: Land bearing a stand of trees at any age or stature, including seedlings and of species attaining a minimum of 6 feet average height at maturity or land from which such a stand has been removed but on which no other use has been substituted. The term is commonly limited to land not in farms; forests on farms are commonly called woodland or farm forests.

Form: The mass of an object or objects that appear unified.

Fracture: The character or appearance of a freshly broken surface of any rock or mineral.

Fracturing (drilling, blasting): Process of breaking up overburden or mineral for ease of removal.

Freeboard: The vertical distance between the normal maximum level of the surface of the liquid in a reservoir and the top of a dam or levee, etc., which is provided so that waves and other movements of the liquid will not overtop the confining structure.

French Drain: A covered ditch containing a layer of fitted or loose stone or other pervious material.

Front-end Loader: A tractor with a digging bucket mounted on the front end.

-G-

Gabion: A mesh container used to confine rocks or stones and used to construct dams and groins or lining stream channels.

Game Food: Numerous grasses, legumes, shrubs, and trees that are planted on reclaimed mined-land to provide sustenance and cover for wildlife whose habitat is natural or adaptable to that particular site.

Geologic or Natural Erosion: Natural erosion caused by geological processes acting over long geologic periods and resulting in the wearing away of mountains, and the building up of flood plains or coastal plains.

Georgia V-ditch: Grading is performed to create positively draining swales midpoint between and parallel to the highwall and lowwall to convey water runoff to drains established to carry the water away from the spoil area.

Germination, Sprouting: Beginning of growth.

Gob: Waste coal, rock pyrites, slate, or other unmerchantable material of relatively large size which is separated from coal and other mined material in the cleaning process.

Gouging: Gouging is a surface configuration intended to trap precipitation, increase infiltration and reduce erosion.

Gradation: A term used to describe the series of sizes into which a soil sample can be divided.

Grade: (a) The slope of a road, channel, or natural ground. (b) The finished surface of a canal bed, roadbed, top of embankment, or bottom of excavation; any surface prepared for the support of construction, like paving or laying a conduit. (c) To finish the surface of a canal bed, roadbed, top of embankment, or bottom of excavation.

Gradient (see texture): The rate of change of any characteristic per unit of length, or slope. The term is usually applied to such things as elevation, velocity, pressure, etc.

Grain Size: Physical size of soil particle, usually determined by either sieve or hydrometer analysis.

Grassed Waterway: A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water from cropland.

Great Soil Group: One of the categories in the system of soil classification that has been used in the United States for many years.

Green Manure Crop: Any crop grown for the purpose of being turned under, incorporated into the soil, while green, for soil improvement.

Ground Cover: Herbaceous vegetation and low-growing woody plants that form an earth cover.

Ground Water: Subsurface water occupying the saturation zone, from which wells and springs are fed. In a strict sense the term applies only to water below the water table. Also called pleroic water; phreatic water.

Growing Season: The season which in general, is warm enough for the growth of plants, the extreme average limits of duration being from the average date of the last killing frost in spring to that of the first killing frost in autumn. On the whole, however, the growing season is confined to that period of the year when the daily means are above 42 degrees F.

Grubbing: The process of removing roots, stumps, and low-growing vegetation.

Gully Erosion: Removal of soil by running water, with formation of deep channels that cannot be smoothed out completely by normal cultivation.

-H-

Habitat: The environment in which the life needs of a plant or animal are supplied.

Hardpan: A hardened soil layer in the lower A or in the B horizon caused by cementation of soil particles with organic matter or with materials such as silica, sesquioxides, or calcium carbonate. The hardness does not change appreciably with changes in moisture content, and pieces of the hard layer do not slake in water.

Harmony: A combination of parts into a pleasing or orderly whole; congruity, a state of agreement or proportionate arrangement of form, line, color, and texture.

Haul Road A temporary road, generally unimproved, used to transport material to and from highway construction, borrow pits, and waste areas.

Head of the Hollow (also valley fill method): Basically, overburden material from adjacent contour or mountain top mines is placed in compacted layers in narrow, steep-sided hollows so that surface drainage is possible.

Head (of water): Water pressure expressed as the feet of elevation difference between the top of the water and the point at which the pressure is exerted.

Heaving: The partial lifting of plants out of the ground, frequently breaking their roots, as a result of freezing and thawing of the surface soil during the winter.

Heavy Soil: (Obsolete in scientific use) A soil with a high content of the fine separates, particularly clay, or one with a high drawbar pull and hence difficult to cultivate.

Herbaceous: Vegetation that is nonwoody.

Herbicides: Chemicals used to control or eradicate vegetation.

Highwall: The unexcavated face of exposed overburden and coal in a surface mine or the face or bank on the uphill side of a contour strip mine excavation.

Hot: Refers to material in the overburden or gob piles either capable of spontaneous ignition or containing highly acid producing material.

Humid: A term applied to regions or climates where moisture, when distributed normally throughout the year, should not be a limiting factor in the production of most crops. The lower limit of precipitation under cool climates may be as little as 51 cm (20 in.) annually. In hot climates it may be as much as 152 cm (60 in.). Natural vegetation is generally a forest.

Humus: That more or less stable fraction of the soil organic matter remaining after the major portion of added plant and animal residues has decomposed, usually amorphous and dark-colored.

Hydrology: The science that relates to the water systems of the earth.

Hydroseeding: Dissemination of seed hydraulically in a water medium. Mulch, lime, and fertilizer can be incorporated into the sprayed mixture.

Impact (Fish and Wildlife):
direct - all impacts that are caused by mining activities during operation of the mine and which occur in the general locality of actual mining activities.

indirect - impacts attributable to natural ecological and/or metero-logical events acting on the results of surface mining.

Impervious: Prohibits fluid flow.

Impoundment: A reservoir for collection of water. Collection of water by damming a stream or the like. Used in connection with the storage of tailings from a mine.

Incorporate: To mix foreign materials, such as pesticides, fertilizers, or plant residues, into the soil.

Indicator Plants: Plants characteristic of specific soil or site conditions.

Indigenous: Produced, growing, or living naturally in a particular region or environment.

Infiltration: Water entering the ground water system through the land surface.

Initial Cut: The first excavation made to gain access to and expose the mineral. The initial cut supplies only enough room to install the first set of equipment and remove the first cut of mineral.

Inoculation: The process of adding cultures of symbiotic micro-organisms to legume seed to enhance atmospheric nitrogen fixation.

Intermittent Stream: A stream or portion of a stream that flows only in direct response to precipitation. It receives little or no water from springs and is dry for a large part of the year.

Internal Soil Drainage: The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers and by the height of the water table, either permanent or perched. Relative terms for expressing internal drainage are none, very slow, slow, medium, rapid, and very rapid.

Interstice: A pore or small open space in rock or granular material, not occupied by solid mineral matter. It may be occupied by air, water, or other gaseous or liquid material. Also called void or void space.

Intrusion: A feature (land, vegetation, or structure) which is generally considered out of context with the characteristic landscape.

Inundate: To flood an entire mine with water or a large section of the workings.

-L-

Land Classification: Classification of specific bodies of land according to their characteristics or to their capabilities for use. A use capability classification may be defined as one based on both physical and economic considerations according to their capabilities for man's use, with sufficient detail of categorical definition and cartographic (mapping) expression to indicate those differences significant to men.

Land Disturbance: Any action, use, or phenomenon which affects the existing land resource values.

Landscape Modifying Activities: Any action which changes the vegetation or landform or places structures on the landscape.

Landscape Character: The arrangement of a particular landscape as formed by the variety and intensity of the four basic elements of form, line, color, and texture.

Landslide: The failure of a slope in which the movement of the soil mass takes place along interior surfaces of sliding.

Land use Planning: The development of plans for the uses of land that, over long periods, will best serve the general welfare, together with the formulation of ways and means for achieving such uses.

Last Cut: In area mining, the last linear excavation made as a result of which a highwall remains.

Lateral Movement: This method removes coal by stripping and augering with no material being placed on the downslope. Lateral movement reduces disturbed acreage by nearly two thirds when compared with conventional surface mining because the overburden is hauled by truck laterally along the bench and then backfilled against the highway.

Leachate: Liquid that has percolated through a medium and has extracted dissolved or suspended materials from it.

Leached Soil: A soil from which most of the soluble materials ($CaCO_3$, $MgCO_3$, and more soluble materials) have been removed from one part of the profile and have accumulated in a lower part.

Leaching: The removal of materials in solution by the passage of water through soil.

Legume: A member of the legume or pulse family, Leguminosae. One of the most important and widely distributed plant families. The fruit is a "legume" or pod that opens along two sutures when ripe. Flowers are usually papilionaceous (butterflylike). Leaves are alternate, have stipules, and are usually compound. Includes many valuable food and forage species, such as the peas, beans, peanuts, clovers, alfalfas, sweet clovers, lespedezas, vetches, and kudzu. Practically all legumes are nitrogen-fixing plants.

Lignite: A brownish-black coal in which the alteration of vegetal material has proceeded further than in peat, but not so far as sub-bituminous coal.

Lime; Lime, from the strictly chemical standpoint, refers to only one compound, calcium oxide (CaO); however, the term line is commonly used in agriculture to include a great variety of materials which are usually composed of the oxide, hydroxide, or carbonate of calcium or of calcium and magnesium. The most commonly used forms of agricultural lime are ground limestone, marl, and oyster shells (carbonates), hydrated lime (hydroxides), and burnt lime (oxides).

Quicklime	- Limestone + heat (calcined) CaO
Hydrated lime	- quicklime + H_2O $(Ca(OH)_2$
Slaked lime	- same as hydrated but slaking equipment is used for adding water
Milk of lime	- water mixture containing lime in solution + lime in suspension

Lime Requirement: The amount of standard ground limestone required to bring a 6.6 inch layer of an acre (about 2 million pounds of mineral soils) of acid soil to some specific lesser degree of acidity, usually to slightly or very slightly acid. In common practice, lime requirements are given in tons per acre of nearly pure limestone, ground finely enough so that all of it passes a 10-mesh screen and at least half of it passes a 100-mesh screen.

Limestone: A bedded sedimentary deposit consisting chiefly of calcium carbonate ($CaCO_3$) which yields lime (CaO) when burned. A general term for that class of rocks which contain at least 80 percent of the carbonates of calcium or magnesium.

Litter: Freshly fallen or slightly decomposed organic debris.

Loess: Material deposited by wind and consisting of predominatly silt-sized particles.

Longwall Stripping: Longwall mining accomplished in areas of shallow cover where surface mining might normally have been conducted. The outby end, where the longwall controls, pumps, and face conveyor discharge end are located, is located in a ditch that is exposed to the surface. Roof chocks are used to protect the mining area and the roof (or overburden) is allowed to settle into the mined out section.

Low Wall: The vertical wall, on the downslope side of the mining operation, consisting of the deposit being mined and some overlying rock and soil strata.

Lysimeter: Structure containing a mass of soil and so designed as to permit the measurement of water draining through the soil.

-M-

Management Activity: An activity of man placed or undertaken on the landscape for the purpose of harvesting, traversing, transporting, protecting, changing or replenishing natural resources.

Mean Particle Dimension: The particle dimension for which half the sediment by weight is coarser and half is finer. Usually expressed in terms of fall diameter in millimeters.

Micro-climate: A local climatic condition near the ground resulting from modification of relief, exposure, or cover.

Micro-nutrients: Nutrients in only small, trace, or minute amounts.

Mined-land: Land with new surface characteristics due to the removal of a mineable commodity by surface mining methods and subsequent surface shaping and revegetation.

Mine Drainage: Any water forming on or discharging from a mining operation. May be alkaline or acid in nature.

Mine Dumps: Surface area used for disposal of mine and/or preparation plant waste.

Mined-land: Land with new surface characteristics due to the removal of mineable commodity by surface mining methods and subsequent surface reclamation.

Mineral Seam: Layer of strata in which a mineral is contained. (eg. coal seam, shale oil seam, etc.)

Mitigation: To reduce or alleviate negative impacts caused by surface mining on the environment.

Modified Block Cut: This method of surface mining adapts the "Block cut" method to steeply sloped areas. The modification essentially is backfilling with spoil from succeeding blocks rather than from the spoil-producing block.

Mottled Zone: A layer that is marked with spots or blotches of different color or shades of color. The pattern of mottling and the size, abundance and color contrast of the mottles may vary considerably and should be specified in soil description.

Mountain Top Removal: In this mining method, 100 percent of the overburden covering a coal seam is removed in order to recover 100 percent of the mineral. Excess spoil material is hauled to a nearby hollow to create a valley fill.

Mulch: A natural or artificial layer of plant residue or other materials placed on the soil surface to protect seeds, to prevent blowing, to retain soil moisture, to curtail erosion, and to modify soil temperature.

Multiple Seam Mining: Surface mining in areas where several seams are recovered from the same hillside.

-N-

Native Species: A species that is a part of an area's original fauna or flora.

Naturalistic Character: A landscape situation where the basic elements are displayed in a composition that appears natural within the surrounding area or character type.

Natural Revegetation: Natural reestablishment of plants, propagation of new plants over an area by natural processes.

Natural Seeding (volunteer): Natural distribution of seed over an area.

Neutralization: The process of adding an acid or alkaline material to water or soil to adjust its pH to a neutral position.

Neutral Soil: A soil in which the surface layer, at least to normal plow depth, is neither acid nor alkaline in reaction. For most practical purposes, soil with a pH ranging from 6.6 through 7.3.

Nitrogen Fixation: The conversion of atmospheric (free) nitrogen to nitrogen compounds. In soils the assimilation of free nitrogen from the air by soil organisms (making the nitrogen eventually available to plants). Nitrogen fixing organisms associated with plants such as the legumes are called symbiotic; those not definitely associated with plants are called nonsymbiotic.

Nurse Crop: A planting or seeding that is used to protect a tender species during its early life. A nurse crop is usually temporary and gives way to the permanent crop. Sometimes referred to as a companion crop.

Nutrients: Any element taken into a plant that is essential to its growth.

Open Cut: Longitudinal excavation made by strip mining to expose a mineral seam.

Open Pit Mining: Surface mining in which (1) the amount of material removed is large in proportion to the surface area disturbed, (2) mining continues in the same area proceeding downward with lateral expansion of the pit necessary to maintain slope stability or as necessary to accommodate the orderly expansion of the total mining operation, (3) the operations take place on the same relatively limited site for an extended period of time, (4) in most cases there is no practicable method to reclaim the land, and (5) there is no practicable alternative method of mining the mineral involved.

Operation: All of the premises, facilities, railroad loops, roads and equipment used in the process of producing and removing mineral from a designated strip mine area or prospecting for the purpose of determining the location, quality or quantity of a natural mineral deposit.

Original Contour: The pre-mining surface configuration of the land, not necessarily the pre-mining elevation.

Orphaned Lands: Lands on which the extraction of minerals or materials, noncompatible uses, uncontrolled actions, or natural phenomena have adversely affected the environment and on which no action or effort has been exercised to equal or exceed the resource values existent prior to disturbance; also sometimes referred to as abandoned lands.

Outcrop: Coal which appears at or near the surface; the intersection of a coal seam with the surface.

Outslope: The exposed area sloping away from a bench cut section.

Optional Seeding Time: Time(s) of year best suited for germination and seedling survival.

Overburden: All of the earth and other materials which lie above a natural mineral deposit and also means such earth and other material after removal from their natural state in the process of strip mining.

Over the Shoulder: A method of handling overburden whereby it is moved parallel to the highwall instead of at right angles to the wall as normally done.

-P-

Parent Material (soils): The unconsolidated, relatively unweathered mineral or organic matter from which the surface of soils have developed.

Particle-size Analysis: Determination of the amounts of different particle sizes in a soil sample, usually by sedimentation, sieving, micrometry, or combinations of these methods.

Peak: The tops of strip mine banks before grading.

Ped: A unit of soil structure such as an aggregate, crumb, prism, block, or granule, formed by natural processes (in contrast with a clod, which is formed artificially).

Percolation: Downward movement of water through soils.

Perennial Plant: A plant that normally lives for 3 or more years.

Permeability: The capacity for transmitting a fluid. It is measured by the rate at which a fluid of standard viscosity can move through material in a given interval of time under a given hydraulic gradient.

pH: The symbol or term refers to a scale commonly used to express the degrees of acidity or alkalinity. On this scale pH of 1 is the strongest acid, pH of 14 is the strongest alkali, pH of 7 is the point of neutrality at which there is neither acidity or alkalinity. pH is not a measure of the weight of acid or alkali contained in or available in a given volume.

Piezometer: An instrument for measuring pressure head in a conduit, tank, soil, etc. It usually consists of a small pipe or tube tapped into the side of the container, the inside end being flush with, and normal to, the water face of the container, connected with a manometer pressure gage, mercury or water column, or other device for indicating pressure head.

Pit: Used in reference to a specifically describable area of open cut mining. May be used to refer to only that part of the open cut mining area from which coal is being actively removed or may refer to the entire contiguous mined area.

Pit, Borrow: A bank or pit from which earth is taken for use in filling or embanking.

Pit, Test: Test pits, dug by hand or machine, are open excavations large enough to permit a man to enter and examine formations in their natural condition. It is by far the most accurate method of determining the character of materials, but it is also the most costly. Samples in the disturbed or undisturbed condition can be readily taken.

Plant Regeneration: The development of volunteer vegetation from seed or by other natural reproductive processes from plants existing nerarby.

Planting Season: The period of the year when planting and/or transplanting is considered advisable from the standpoint of successful establishment.

Pollution: Environmental degradation resulting from man's activities or natural events.

Post Mining Land Use: That use which will be made of affected lands after mining and reclamation is completed and which is specified in a mining or exploration plan which is approved.

Porosity-effective: The ratio, usually expressed in percentage of (a) the volume of water or other liquid which a given volume of rock or soil, after being saturated with the liquid, will yield under any specified hydraulic conditions to (b) the total volume of soil or rock.

Portal: The surface entrance to an underground mine.

Power Shovel: A large machine for digging, the digging part of which the bucket is the terminal member of an articulated boom. Power to the bucket is supplied either through hydraulic cylinders or cables.

Pre-law: Term used to refer to strip mine operations conducted previous to the passage of a state's first reclamation act.

Preplanning: Process of forseeing reclamation problems and determining measures to minimize off-site damages during the mining operation and to provide for quick stabilization of the mining.

Pressure Pan (traffic sole, plow pan, tillage pan, traffic pan, plow sole, compacted layer): An induced subsurface soil horizon or layer having a higher bulk density and lower total porosity than the soil material directly above and below, but similar in particle size analysis and chemical properties. The pan is usually found just below the maximum depth of normal plowing and frequently restricts root development and water movement.

Productivity, Soil: The capacity of a soil, in its normal environment, for producing a specified plant or sequence of plants under a specified system of management. The "specified" limitations are necessary since no soil can produce all crops with equal success nor can a single system of management produce the same effect on all soils. Productivity emphasizes the capacity of soil to produce crops and should be expressed in terms of yeilds.

Profile, Soil: A vertical section of the soil through all its horizons and extending into the parent material.

Prospecting: The removal of overburden, core drilling, construction of roads or any other disturbance of the surface for the purpose of determining the location, quantity, or quality of a natural mineral deposit.

Prospecting: The search for mineral deposits of existing underground workings, outcropings or surface exposures by geological, geophysical or other methods to determine the preliminary mineral value of the land.

Pullback Machine: This is the use of a smaller dragline to assist the prime-mover machine when the cover is beyond the capability of the shovel or dragline to spoil the overburden without filling the area adjacent to the highwall.

Pure Live Seed: The product of the percentage of germination plus the hard seed and the percentage of pure seed, divided by 100.

-R-

Rail Waste Dumps: A dump which should be a train length long or more.

Rain: (1) Heavy--Rain which is falling at the time of observation with an intensity in excess of 0.30 in. per hr. (over 0.03 inch in 6 min). (2) Light--Rain which is falling at the time of observation with an intensity of between a trace and 0.10 in. per hr. (0.01 inch in 6 min). (3) Moderate-Rain which is falling at the time of observation with an intensity of between 0.11 in.per hr. (0.01+ inch in 6 min.) and 0.30 in. per hr. (0.03 inch in 6 min.).

Range Land: Where the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs, where natural herbivory was an important influence in its precivilization state, and that is more suitable for management by ecological rather than agronomic principles.

Rate, Percolation: The rate, usually expressed as a velocity, at which water moves through saturated granular material. The term is also applied to quantity per unit of time of such movement, and has been used erroneously to designate infiltration rate or infiltration capacity.

Reaction, Soil: The degree of acidity or alkalinity of a soil, usually expressed as a pH value. Descriptive terms commonly associated with certain ranges in pH are: extremely acid, less than 4.5; very strongly acid, 4.5 to 5.0; strongly acid, 5.1 to 5.5; moderately acid, 5.6 to 6.0; slightly acid, 6.1 to 6.5; neutral, 6.6 to 7.3; slightly alkaline, 7.4 to 7.8; moderately alkaline, 7.9 to 8.4; strongly alkaline, 8.5 to 9.0; and very strongly alkaline, greater than 9.1 (see pH, soil).

Reclamation: The process of returning resource values to lands affected by controlled land disturbances to a form and productivity consistent with a stated land use plan which includes a stable ecological state, is compatible with the values of the surrounding lands, and is executed on lands which are fully capable of supporting the uses or higher or better uses which they were capable of supporting prior to disturbance.

controlled land disturbance: includes mining, oil and gas recovery, access roads, powerlines, pipelines, and any other activities which alter the original ground surface, and the resources (either surface or subsurface), and requires prior approval by the regulatory authority.

Reclamation: Means backfilling, grading, highwall reduction, topsoiling, planting, revegetation, and other work to restore an area of land affected by strip mining under an approved plan.

Reclamation Plan: Documentation submitted by an operator which itemizes and details his intentions for reclaiming the lands affected by his mining operation.

Recontour: To grade surface mined land to approximate its original contour.

Recreation Land: Land and water used, or usable primarily as sites for outdoor recreation facilities and activities.

Red Dog: A gob pile after it has burned. The material is generally used as a road surfacing material; it has no harmful acid or alkaline reaction.

Reforestation: The natural or artificial restocking of an area with forest trees.

Refuse: Waste material separated and removed from a mineral that is too low in grade to be of economic value.

Region: A large tract or area of land generally recognized as having similar character types, social and economic amenities, and physiographic types.

Regolith: The unconsolidated mantle of weathered rock and soil material on the earth's surface; loose earth materials above solid rock. (Approximately equivalent to the term "soil" as used by many engineers and geologists).

Regrading: The movement of earth over a depression to change the shape of the land surface. A finer form of backfilling.

Rehabilitation: The process of returning resource values to lands affected by uncontrolled land disturbances to a form and productivity consistent with a stated land use plan which includes a stable ecological state.

> uncontrolled land disturbance: includes fire, floods, landslides, earthquakes, or other types of disturbances arising from natural causes, catastrophic occurrences, or uncontrolled human activity.

Reject: The material extracted from the feed coal during cleaning for retreatment or discard. The stone or dirt discarded from a coal preparation plant, washery or other process, as of no value.

Reservoir: A pond, lake, tank, basin, or other space, either natural in its origin, or created in whole or in part by the building of engineering structures, which is used for storage, regulation, and control of water.

Restoration: The process of restoring site conditions as they were before the land disturbance.

Retention: The amount of precipitation on a drainage area that does not escape as runoff. It is the difference between the total precipitation and total runoff.

Retorting: Process of extracting and converting oil from oil shale, involving verious steps; most requiring heat.

Revegetation: The emergence, continued growth, and sustained productivity, and achievement of long-term natural succession of vegetation, as determined by a qualified scientist, suitable to the approved post-disturbance land use for the land surface. Includes seeding, planting, and measures taken to support stable vegetative growth such as fertilization, cultivation, mulching, irrigation, and harvesting where these support measures are required to achieve the vegetative cover required by the approved plan. Vegetation is considered successful when demonstrated to be durable and to meet the requirements specified in the plans for post-disturbance land use in terms of density, productivity, diversity, species, succession and which shows no signs of a typical disease or future change.

Rider Coal Seam: A "stray" coal seam usually above and divided from the main coal bed by rock, shale or other strata material. The rider seam is generally thin and seldom merchantable.

Rill Erosion: An erosion process in which numerous small channels of only several centimeters in depth are formed; occurs mainly on recently cultivated soils.

Ripping: The act of breaking, with a tractor-drawn ripper or long angled steel tooth, compacted soils or rock into pieces small enough to be economically excavated or moved by other equipment as a scraper or dozer.

Riprap: Broken rock, cobbles, or boulders placed on earth surfaces, such as the face of a dam or the bank of a stream, for protection against the action of water (waves); also applied to brush or pole mattresses, or brush and stone, or other similar materials used for soil erosion control.

Rise: Same as dip except taken in the upward direction versus the downward.

Rock-fill Dam: A dam composed of loose rock usually dumped in place, oftern with the upstream part constructed of handpacked or derrick-placed rock and faced with rolled earth or with an impervious surface of concrete, timber or steel.

Rootbed: The soil depth modified by tillage or amendments in which plant roots are or will be growing.

Rounding, Slope: The modeling or contouring of roadside slopes to provide a curvilinerar transition between several planes; e.g., tops, bottoms, and ends of cuts and fills.

Runoff: That portion of the precipitation on a drainage area that is discharged from the area in stream channels. Types include surface runoff, ground water runoff, or seepage.

Runoff Volume: The total quantity or volume of runoff during a specified time. It may be expressed in acre-feet, in inches of depth on the drainage area, or in other units.

-S-

Saline Soil: A soil containing enough soluble salts to impair its productivity for plants but not containing an excess of exchangeable sodium.

Saline-alkali Soil: A soil having a combination of a harmful quantity of salts and either a high degree of alkalinity or a high amount of exchangeable sodium, or both, so distributed in the soil profile that the growth of most crop plants is less than normal.

Sand: Sediment particles between 0.062 and 2 mm in diameter.

Sandstone: A cemented or otherwise compacted detrital sediment composed predominantly of quartz grains, the grades of the latter being those of sand.

Saltation: Particle movement in water or wind where particles skid or bounce along the streambed or soil surface.

Saltation Load: The sediment bounced along the streambed by the impact of the flow or of other moving particles.

Saturation: Completely filled, a condition reached by a material, whether it be in solid, gaseous, or liquid state, which holds another material within itself in a given state in an amount such that no more of such material can be held within it in the same state. The material is then said to be saturated or in a condition of saturation.

Scale: The basic-size relationship between an object and the surroundings in which the object is placed.

Scalping: Removal of sod or other vegetation in spots or strips.

Scarify: To abrade, scratch, or modify the surface; for example, to scratch the impervious seed coat of hard seed, or to break the surface of the soil with a narrow-bladed implement.

Scenic Quality: The quality of the scenery as determined through the use of the scenic evaluation process.

Scoria: A slaglike clinker deposit characteristic of burned-out coal beds, especially in the western Great Plains.

Scour: The wearing away of terrace or diversion channels or streambeds.

Season(s): Any of the four arbitrary divisions of the year, characterized chiefly by the differences in temperature, precipitation, and amount of daylight.

Seam: A stratum or bed of coal.

Secondary Blasting: Reblasting oversize pieces of rock to reduce them to a size suitable for handling by the excavating, materials transporting and crushing equipment available.

Secondary Coal Recovery: This is analogous to "mining the pillars" in deep mining in that the coal is taken on the retreat or after primary mining has been completed. When the final cut has been made in an open-cut coal mine the coal seam remains exposed in the bank and three methods are used to recover as much of the coal as can be economically won (a) coal augers, (b) push-button miner and (c) punch mining by underground machines.

Sediment: Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.

Sediment Basin: A reservoir for the confinement and retention of silt, gravel, rock, or other debris from a sediment-producing area.

Sediment Concentration: The quantity of sediment relative to the quantity of transporting or suspending fluid, or fluid-sediment mixture. Usually expressed as milligrams per liter.

Sediment Depletion: The volume of impoundment water storage lost due to the deposition of sediment.

Sedimentation Diameter: (of a particle): The diameter of a sphere that has the same specific gravity and terminal uniform settling velocity as the given particle in the same sedimentation fluid.

Sediment Discharge: The quantity of sediment that is carried past any cross section of a stream in a unit of time. The discharge may be limited to certain sizes of sediment or to discharge through a specific part of the cross section. Usually expressed as tons per day.

> Sediment load: The quantity of sediment, measured in dry weight or by volume, transported through a stream cross section in a given time. Sediment load consists of both suspended load and bedload.
>
> Sediment pool: The reservoir space allotted to the accumulation of submerged sediment during the life of the structure.

Sediment Yield: The total sediment outflow from a watershed or a drainage area at a point of reference and in a specified period of time. This is equal to the sediment discharge from the contributing drainage area, expressed usually in terms of tons per square mile per year.

Sedimentation: The geologic process which includes erosion, transportation, and desposition of solid particles by wind or water.

Seedbed: The soil prepared by natural or artificial means to promote the germination of seeds and the growth of seedlings.

Seeding Rate: Amount of seed applied per unit area in revegetation efforts.

Seed Purity: The percentage of the desired species of seeds in relation to the total quantity, including other species, weed seeds, and foreign matter.

Seep: A more or less poorly defined area where water oozes from the earth in small quantities.

Seepage: Water excaping through or emerging from the ground along an extensive line or surface as contrasted with a spring where the water emerges from a localized spot.

Selected Earth Material: Suitable native material obtained from roadway cuts or borrow areas, or other similar material used for subbase, roadbed material, shoulder surfacing, slope cover, or other specific purposes.

Sere: A sequence of ecological communities that succeed one another in the biotic development of an area.

Shaft Mine: One where the coal seam is reached by a vertical shaft which may vary in depth from less than 100 feet to several thousand feet. A mine in which the main entry or access is by means of a shaft.

Shale: Sedimentary or stratified rock structure generally formed by the consolidation of clay or clay-like material.

Sheet Erosion: The removal of a fairly uniform layer of soil from the land surface by runoff water.

Sheet Flow: Water, usually storm runoff, flowing in a thin layer over the ground surface. Syn., overland flow.

Shotgun Mixture: Seeding a number of species at random.

Shovel: Excavating or coal-loading machine that utilizes a bucket mounted on and operated by means of a handle or dipper stick that moves longitudinally on gears and which is lifted or lowered by cable. The entire machine is mounted on crawlers for mobility and the upper structure is mounted on rollers and rail for swing or turn.

Shovel Overcasting: The process of overcasting material from the bank into the mined-out pit when digging straight ahead and spoiling at a swinging angle averagine 90 degrees or less.

Side Slope: The slope of the sides of a canal, dam, or embankment. It is customary to name the horizontal distance first, as 1.5:1 or, frequently, 1-1/2:1, meaning a horizontal distance of 1.5 feet to 1 ft. vertical.

Sieve Diameter (of a particle): The diameter of a sphere equal to the length of the side of a square sieve opening through which the given particle will just pass.

Silt: Soil, rock, or organic particles or other materials that are or have been transported by streams flowing from or through and contributed by the area affected by mining operation.

Site: (a) In ecology, an area described or defined by its biotic, climatic, and soil conditions as related to its capacity to produce vegetation. (b) An area sufficiently uniform in biotic, climatic, and soil conditions to produce a particular climax vegetation.

Size Distribution: When applied in relation to any of the size concepts, refers to distribution of material by percentages or proportions by weight.

Slate: A miners term for any shale or slate accompanying coal. Geologically it is a dense, fine textured, metamorphic rock, which has excellent parallel clearage so that it breaks into thin plates or pencil-like shapes.

Slip, Slide, Slump: A mass of overburden, soil, or spoil material that moves downward and outward to a lower elevation because of the force of gravity.

Slope: The degree of deviation of a surface from the horizontal, usually expressed in a ratio, percent, or degrees.

Slope Characteristics: Slopes may be characterized as concave (decrease in steepness in lower portion), uniform, or convex (increase in steepness at base). Erosion is strongly affected by shape, ranked in order of increasing erodibility from concave to uniform to convex.

Slope Drains: Permanent or temporary devices that are used to carry water down cut or embankment slopes. May be pipe, half sections, paved, or have special plastic lining.

Slope Reduction Method: A mine opened by a slope or incline. A mine with an inclined opening used for the same purpose as a shaft or a drift mine.

Slope Reduction Method: Overburden from the first cut is spread over a predetermined area of the outslope in such a manner that the natural angle of slope is reduced.

Slope Stability: The resistance of any inclined surface, as the wall of an open pit or cut, to failure by sliding or collapsing.

Sludge: The precipitate resulting from chemical treatment of water, coagulation, or sedimentation.

Sludge Density: A measure of the weight of solids contained in the sludge in relation to total weight.

Slurry: Refuse separated from the coal in the coal cleaning process of relatively small size which is readily pumpable in the washing plant effluent. A pulverized coal-liquid mixture transported by pipeline.

Sod: A closely knit ground cover growth, primarily of grasses.

Sod Grasses: Stoloniferous or rhizomatous grasses that form a sod or turf.

Sodium Absorption Ratio: An index of hazard to physical condition of soil due to sodium in irrigation water.

Soil: (See acid soil and alkaline soil). Surface layer of the earth, ranging in thickness from a few inches to several feet composed of finely divided rock debris mixed with decomposing vegetative and animal matter which is capable of supporting plant growth.

Soil Amendments: Any material, such as lime, gypsum, sawdust, or synthetic conditioners worked into a soil to improve its chemical or physical properties.

Soil Conditioner: Any chemical material added to a soil surface for the purpose of improving its physical condition.

Soil Conservation: Protection of the soil against physical loss by erosion or against chemical deterioration; that is, excessive loss of fertility by either natural or artificial means.

Soil Conserving Crops: Crops that prevent or retard erosion and maintain or replenish rather than deplete soil organic matter.

Soil Horizon: A layer of soil or soil material approximately parallel to the land surface and differing from adjacent genetically related layers in physical, chemical, and biological properties or characteristics, such as color, sturcture, texture, consistency, kinds and numbers of organisms present, and degree of acidity or alkalinity.

Soil Management: The combination of all tillage operations, cropping practices, fertilizer, lime, and other treatments applied to the soil for the production of plants.

Soil Map: A map showing the distribution of soil mapping units in relation to the prominent physical and cultural features of the earth's surface.

Soil Organic Matter: The organic fraction of the soil that includes plant and animal residues at various stages of decomposition, cells and tissues of soil organisms, and substances synthesized by the soil population. Commonly determined as the amount of organic carbon contained in a soil sample passed through a 2-mm sieve.

Soil Porosity: The degree to which the soil mass is permeated with pores or cavities. It is expressed as the percentage of the whole volume of the soil which is unoccupied by solid particles.

Soil Profile: A vertical section of the soil through all its horizons and extending into the parent material.

Soil Series: The basic unit of soil classification being a subdivision of a family and consisting of soils which are essentially alike in all major profile characteristics except the texture of the A horizon.

Soil Stabilization: To settle of fix soil in place against slumping and erosion, usually accomplished by planting vegetation or by mechanical compaction.

Soil Structure: The combination or arrangement of primary soil particles into secondary particles, units, or horizons.

Soil Survey: A general term for the systematic examination of soils in the field and in laboratories; their description and classification; the mapping of kinds of soil; the interpretation of soils according to their adaptability for various crops, grasses, and trees; their behavior under use or treatment for plant production or for other purposes.

Soil Texture: Soil textural class names of soils are based upon the relative percentages of sand, silt, and clay.

Solum: The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soils includes the A and B horizons. Usually the characteristics of the material in these horizons are quite unlike those of the underlying parent material. The living roots and other plant life and animal life characteristic of the soil are largely confined to the solum.

Spatial Concentration: The dry weight of sediment per unit volume of water-sediment mixture in place, or the ratio of the dry weight of sediment to the total weight of water-sediment mixture in a sample or unit volume, of the mixture. Spatial concentration could best be sampled by instantaneously enclosing the desired volume of the water-sediment mixture and removing that volume as a sample.

Species: Rare - A species not commonly found in a given area due to its habitat requirements, small population size, or discrete distributional pattersn, etc.

Threatened - A species whose future existence is jeopardized in the forseeable future because its habitat is threatened with destruction, drastic modification, or severe curtailment or for other reasons such as over-exploitation, disease, pollution. predation, etc.

Endangered - A species whose continued existence is in immediate peril because of critically low or declining populations.

Unique - A species only found in a particular area, region, or habitat type.

Game - Any animal harvested or taken for food or sport.

Specific Weight (of sediment): The dry weight per unit volume of sediment in place. It can be computed from the set bulk density if the specific gravity of the sediment is known. Usually expressed as grams per cubic centimeter.

Spillway: A waterway in or about a dam or other hydraulic structure for the escape of excess water.

Splash Erosion: The spattering of small soil particles caused by the impact of raindrops on very wet soils. The loosened and spattered particles may or may not be subsequently removed by surface runoff.

Spoil: The overburden or non-coal material removed in gaining access to the coal or mineral material in surface mining.

Spoil Bank (spoil pile): Area created by the deposited spoil or overburden material prior to backfilling. Also called cast overburden.

Spoil Ridge: A series of contiguous piles of spoil deposited adjacent and roughly parallel to the mine excavation.

Sprigging: The planting of a portion of the stem and/or root of grass.

Stabilize: Settle, fix in place, non-moving, usually accomplished on overburden by planting trees, shrubs, or grasses, or by mechanical compaction or aging.

Standing Crop; Production: The total biomass of organisms of one or more species within an area; the amount of organic material produced within a given period by organisms.

Steep Slope: Any slope in excess of 20 degrees (36.4 percent) or such lesser slope as may be defined by the regulatory authority after consideration of soil, climate, and other characteristics of a region, state, or lease area.

Stipulation: A condition or requirement placed on a surface mining permit or lease generally designed to limit adverse impacts.

Stockpiling: Process of storing removed topsoil, overburden, or mineral.

Storage Volume: The storage increment of a reservoir that is available for a designated purpose: i.e., flood control, multipurpose, sediment, irrigation, power, etc.

Stratified: Composed of, or arranged in, strata or layers, as stratified alluvium. The term is applied to geological materials. Those layers in soils that are produced by the processes of soil formation are called horizons, while those inherited from parent material are called strata.

Stream Discharge: The quantity of natural water passing through a cross section of a stream in a unit of time. (The natural water contains both dissolved solids and sediment.) Usually expressed as cubic feet per second.

Strike: The coarse or bearing of the outcrop of an inclined bed or structure on a level surface. Also the direction or bearing of a horizontal line in the plane of an inclined stratum, joint, fault, cleavage plane, or other structural plane. It is always perpendicular to the dip direction.

Strike-off: To reduce the height and slope of spoil piles by mechanically truncating the peaks and smoothing out narrow ridges, generally with a motor grader or dozer.

Strip Mine Refers to a procedure of mining which entails the complete removal of all material from over the product to be mined in a series of rows or strips; also referred to as "open cut," "open pit," or "surface mine."

Strip Mining: Any part of the process followed in the production of mineral by the open cut method including mining by the auger method or any similar method which penetrates a mineral deposit and removes mineral directly through a series of openings made by a machine which enters the deposit from a surface excavation, or any other mining method or process in which the strata or overburden is removed or displaced in order to recover the mineral.

Stripping: The removal of earth or non-ore rock materials as required to gain access to the ore or mineral materials wanted. The process of removing overburden or waste material in a surface mining operation.

Stripping Ratio: The ratio of removed overburden to extractable mineral resource.

Structure Contour: A line shown on a map that is drawn through all points of equal elevation on an inclined strata.

Sub-bituminous Coal: Coal of rank intermediate between lignite and bituminous, with calorific values in the range of 8,000 to 13,000 BTU per pound.

Subdrain: A pervious backfilled trench containing a pipe or stone for the purpose of intercepting ground water or seepage.

Subsidence : The settling or sinking of the land surface because of drainage or because of collapse of underground cavities such as those resulting from underground mining.

Subsidence Break: The fracture in the rocks overlying a coal seam or mineral deposit as a result of its removal by mining operations. The subsidence break usually extends from the face upwards and backwards over the unworked area.

Subsoil: The B horizon of soils with distinct profiles. In soils with weak profile development, the subsoil can be defined as the soil below the plowed soil (or its equivalent of surface soil) in which roots normally grow. Although a common term, it cannot be defined accurately. It has been carried over from early days when "soil" was conceived only as the plowed soil and that under it as "subsoil."

Substitute Lands: Lands previously mined that are reclaimed in lieu of the reclamation of lands at the active or planned mine site.

Surface Mining: A method whereby the overlying materials are removed to expose the mineral for extraction.

Surface Mining & Reclamation Operations: Surface mining operations and all activities necessary and incident to the reclamation of such operations.

Surface Soil: The uppermost part of the soil, ordinarily moved in tillage, or its equivalent in uncultivated soils, ranging in depth from about 13 to 20 cm (5 to 8 in.). Frequently designated as the plow layer, the Ap layer, or the Ap horizon.

Survival Standards: Standards to measure the effectiveness of the re-vegetation phase of reclamation by the extent to which seeded or planted species become capable of self-regenerative growth (usually measured by percent of area having specific types of growing plants and the sizes of plant-devoid areas).

Suspended Sediment or Suspended Load: Sediment that is supported by the upward components of turbulent currents and that stays in suspension for appreciable lengths of time.

Suspended-sediment Discharge: The quantity of suspended sediment passing through a stream cross section in a unit of time. Usually expressed as tons per day.

Suspended Solids: Sediment which is in suspension in water but which will physically settle out under quiescent conditions (as differentiated from dissolved material).

Sweet: Refers to the lime content or calcareous condition of the over-burden which indicates a neutral or slightly alkaline material capable of supporting certain calcium-demanding plants; indicates a pH of 7 or above.

Syncline: A fold of rock beds that is convex downward.

-T-

Tacking (mulch): The process of binding mulch fibers together by the addition of a sprayed chemical compound.

Tailings: The parts or part of any incoherent or fuluid material separated as surface refuse. Usually will not support vegetative growth.

Terrace: Sloping ground cut into a succession of benches and steep inclines for purposes of cultivation or to control surface runoff and minimize soil erosions.

Terraced Slope: A slope that is intersected by one or more terraces.

Terrace Types: Absorptive - a ridge type of terrace used primarily for moisture conservation. Bench - a terrace approximately on the contour, having a steep or vertical drop to the slope below, and having a horizontal or gently sloping part. It is adapted to steeper slopes. Drainage - a broad channel-type terrace used primarily to conduct water from the area at a low velocity. It is adapted to less absorptive soil and regions of high rainfall.

Texture: The visual result of the tactile surface characteristic of an object or objectives.

Texture: The character, arrangement and mode of aggregation of particles which make up the earth's surface.

Tillage: The mechanical manipulation of soil for any purpose; but in agriculture it is usually restricted to the modifying of soil conditions for crop production.

Tillage Equipment (tools): Field tools and machinery which are designed to lift, invert, stir, or pack soil, reduce size of clods and uproot weeds; i.e., plows, harrows, disks, and cultivators.

Tilth: The physical condition of soil as related to its ease of tillage, fitness as a seedbed, and its impedance to seedling emergence and root penetration.

Toe (engineering): The lower edge or edges of a slope.

Tolerant: Capable of growth and survival under competitive growing conditions.

Topography: The shape of the ground surface, such as hills, mountains or plains. Steep topography indicates steep slopes or hilly land; flat topography indicates flat land with minor undulations and gentle slopes.

Topsoil: The unconsolidated mineral matter naturally present on the surface of the earth that has been subjected to and influenced by genetic and environmental factors of parent material, climate, macro- and micro-organisms, and topography, all acting over a period of time, and that is necessary for the growth and regeneration of vegetation on the surface of the earth.

Toxic Material; A substance that through its chemical action usually kills, injures, or impairs an organism.

Toxic Spoil: (See also acid spoil). Includes acid spoil with pH below 4.0. Also refers to spoil having amounts of minerals such as boron, aluminum, manganes, and iron that adversely affect plant growth.

Transpiration: The process by which water vapor is released to the atmosphere by the foliage or other parts of a living plant.

Truck-and-shovel Operation: A mineral removal operation in which a power shovel located in the pit, loads blasted or unconsolidated mineral and overburden into large trucks for removal.

Tubeling: A plant (usually shrub) with its root system grown in a paper tube to aid in its future transplanting and establishment in reclaimed area.

-U-

Unconsolidated (soil material): Soil material in a form of loose aggregation.

Underclay: A bed of clay highly siliceous in some cases and highly aluminous in many others, occurring immediately beneath a coal seam, and representing the soil in which the trees of the Carboniferous swamp forests were rooted.

Underground (underflow) Runoff (seepage): Water flowing toward or into stream channels from adjacent ground.

Undergrowth: Seedlings, schoots, and small saplings under an existing stand of trees.

-V-

Vegetation: General term including grasses, legumes, shrubs, trees naturally occurring and planted intentionally.

Vegetative Cover: The entire vegetative canopy on an area.

Volunteer: Springing up spontaneously or without being planted; a volunteer plant.

-W-

Warm-season Plant: A plant that completes most of its growth during the warm portion of the year, generally late spring and summer.

Washery Refuse: The refuse removed at preparation plants from newly mined coal.

Water Bar: Any device or structure placed in or upon a haul or access road for the purpose of channeling or diverting the flow of water off the road.

Water Conservation: The physical control, protection, management, and use of water resources in such a way as to maintain crop grazing and forest lands, vegetal cover, wildlife and wildlife habitat for maximum sustained benefits to people, agriculture, industry, commerce and other segments of the national economy.

Water Control (soil and water conservation): The physical control of water by such measures as conservation practices on the land, channel improvements, and installation of structures for water retardation.

Water, Subsurface: Water that occurs beneath the surface of the earth. It may be liquid, solid or gaseous state. It comprises suspended water and ground water.

Water Table : The upper surface of groundwater or that level below which the soil is saturated with water.

Water Table, Perched: The water table of a saturated layer of soil which is separated from an underlying saturated layer by an unsaturated layer.

Watershed Area: Surface region or area contributing to the supply of a stream or lake, drainage area, drainage basin, catchment area.

Weathering: The group of processes, such as chemical action of air and rainwater and of plants and bacteria and the mechanical action of changes in temperature, whereby rocks, on exposure to the weather, change in character, decay, and finally crumble.

Weir: A notch over which liquids flow and which is used to measure the rate of flow. A dam across a stream for diverting or measuring the flow. Note: The essential difference between an orifice and a weir is implicit in the expression: water flows through an orifice but over a weir. Orifice usually refers to comparatively samll devices whereas weir includes both small and large structures. Further, the stream of water which is known as jet when issuing from an orifice becomes the nappe, sheet or vein when flowing over a weir.

Wildlife : Undomesticated vertebrate animals, except fish, considered collectively.

-Z-

Zingg Bench Terrace: A special type of bench terrace designed for dryland moisture conservation. It employs an earthen embankment similar to the ridge terrace; a part of the terrace interval immediately above the ridge is bench levelled. Runoff water from the sloping area is retained on the levelled area and absorbed by the soil.